ABSTRACT

Disposable test strips and a wet chemistry method for measuring each of β-hydroxybutyrate alone, combined β-hydroxybutyrate and acetoacetate or total ketone bodies (i.e., β-hydroxybutyrate, acetoacetate and acetone) in human bodily fluid samples, including but not limited to urine, saliva or sweat are described. The test strips need only be dipped in the sample and can be used by anyone in almost any milieu. Measurement can be made electrochemically, spectrophotometrically, fluorometrically or by comparision to a color standard. Combined acetoacetate and β-hydroxybutyrate which account for 97-98% of total ketone bodies and may be measured in a cyclic reaction that occurs at pH about 7.0 to about 8.3 with β-hydroxybutyrate dehydrogenase, (β-HBD), nicotinamide adenine dinucleotide, a tetrazolium dye precursor and an electron mediator. Using this reaction, false positive results obtained from urine samples taken from patients on sulfhydryl drugs are avoided. β-HBD from some sources was found to cause false negative results in samples (e.g. urine) containing high chloride content due to chloride inhibition of β-HBD. Using a simple test for chloride inhibition, it was found that β-HBD from *Alcaligenes* is not so inhibited. Using either β-HBD that is *not* inhibited by chloride or using 10-20 times the normal concentration of this enzyme eliminates false negatives in samples having substantial chloride content, such as urine, both in the reaction described above and in other reactions disclosed for measuring each of β-hydroxybutyrate alone, combined β-hydroxybutyrate and acetoacetate and total ketone bodies, all of which reactions occur in the pH range of about 8.6 to about 9.5.